

REMARKS

Claims 1-67 remain in the application for consideration. In view of the following remarks amendments and/or remarks, Applicant respectfully requests that the application be forwarded onto issuance.

The Claim Rejections

Claims 1-10, 12-20, 22-36, 45-62, and 64-67 stand rejected under 35 U.S.C. §103(a) as being obvious over U.S. Patent No. 6,091,956 to Hollenberg in view of U.S. Patent No. 5,539,922 to Wang.

Claims 11, 21, 37-44, and 63 stand rejected under 35 U.S.C. §103(a) as being obvious over Hollenberg in view of Wang and U.S. Patent No. 6,088,717 to Reed et al. (hereinafter "Reed").

Before undertaking a discussion of the substance of the Office's rejections, the following discussion of the §103 Standard, as well as the references to Hollenberg and Wang is provided in an attempt to help the Office appreciate various distinctions between the claimed embodiments and the cited references.

The §103 Standard

In making out a §103 rejection, the Federal Circuit has stated that when one or more reference or source of prior art is required in establishing obviousness, "it is necessary to ascertain whether the prior art *teachings* would appear to be sufficient to one of ordinary skill in the art to suggest making the claimed substitutions or other modification." *In re Fine*, 5 USPQ 2d, 1596, 1598 (Fed. Cir. 1988). That is, to make out a prima facie case of obviousness, the references must

1 be examined to ascertain whether the combined *teachings* render the claimed
2 subject matter obvious. *In re Wood*, 202 USPQ 171, 174 (C.C.P.A. 1979).

3 Moreover, there is a requirement that there must be some reason,
4 suggestion, or motivation *from the prior art*, as a whole, for the person of ordinary
5 skill to have combined or modified the references. *See, In re Geiger*, 2 USPQ 2d
6 1276, 1278 (Fed. Cir. 1987). It is impermissible to use the claimed invention as an
7 instruction manual or "template" to piece together the teachings of the prior art so
8 that the claimed invention is rendered obvious. One cannot use hindsight
9 reconstruction to pick and choose among isolated disclosures in the prior art to
10 deprecate the claimed invention. *In re Fritch*, 23 USPQ 2d 1780, 1784 (Fed. Cir.
11 1992).

12 A factor cutting against a finding of motivation to combine or modify the
13 prior art is when the prior art *teaches away* from the claimed combination. A
14 reference is said to teach away when a person of ordinary skill, upon reading the
15 reference, would be led in a direction divergent from the path that the applicant
16 took. *In re Gurley*, 31 USPQ 2d 1130, 1131 (Fed. Cir 1994).

17 In order for a prima facie case of obviousness to be made, the resulting
18 combination or motivation must appear to show or suggest the claimed invention.
19 *In re Nielson*, 2 USPQ 2d 1525, 1528 (Fed. Cir. 1987).

20 21 The Hollenberg Reference

22 Generally, Hollenberg's disclosure is directed to a so-called "Situation
23 Information System" which relates to information communications between
24 sources of information and one or more information users which also provide
25 information to other users. In accordance with Hollenberg's various described

1 embodiments, a communication system comprises multiple transceivers that
2 transmit a query signal to mobile transponder devices included in handheld
3 personal computing devices. When the transponder responds with an
4 identification sequence, its location is then computed through so-called
5 chronometric triangulation techniques that are based upon transponder signal
6 arrival times at the system receivers.

7 The gist of Hollenberg's disclosure is perhaps best appreciated from its Fig.
8 1 and the related discussion. Specifically, Fig. 1 shows a "situation information
9 system" that is employed in a shopping area. The system includes various rf
10 antennas 14a, 14b, and 14c, the locations of which are known, and which
11 generally transmit and receive information from mobile computers 18a, 18b, and
12 18c. The situation information system is disclosed to provide services from a
13 service provider that includes finding the locations of the mobile computers and
14 receiving information requests. The situation information system includes a
15 control system 36a that is connected to each antenna by way of transceiver-A 32a,
16 transceiver-B 32b, and transceiver-C 32c, respectively. Control system 36a is
17 connected to data and memory components 38a and 39a, respectively, and to other
18 systems.

19 Hollenberg's service provider includes transceivers 32a, 32b, and 32c,
20 antennas 14a, 14b, and 14c, GPS receiver 34a, GPS antenna 21a, control system
21 36a, network 30a, data 38a, memory 39a, and communications network 31a.

22 Hollenberg's situation information system is disclosed to operate in two
23 modes—a location finding mode and a situation information service mode.
24 Hollenberg's location finding mode is perhaps more germane to the subject matter
25 claimed in the present application. Hence, understanding the nuances of how this

1 particular mode works can facilitate an appreciation for the patentable distinctions
2 embodied in the various embodiments that are claimed in the present application.

3 Exploring the location finding mode in more detail, Hollenberg instructs, in
4 column 12 starting at line 41, that the location finding function utilizes
5 transceivers 32a, 32b, and 32c (Fig. 1) which are time-calibrated and synchronized
6 by means of precise timing signals introduced to control system 36a, such as from
7 satellite 20a. One of transceivers 32a, 32b, or 32c periodically transmits a gating
8 pulse, via antennas 14a, 14b, and 14c, respectively, to a transponder (not shown)
9 located in each of situation information devices 18a, 18b, and 18c. Each of the
10 transponders subsequently responds to the received gating pulse by transmitting an
11 rf signal such that the differences in arrival times of the transmitted signals at each
12 of the antenna/transceiver pairs are used to compute the intersections of each
13 envelope of distance of each of the transponder containing devices from each of
14 the antennas and hence, the location of each of the devices.

15 Accompanying each of the transponder signals is an identification code
16 which uniquely identifies its device by means of which the location of each user is
17 determined and identified by the situation information service provider. The user's
18 location coordinates are then transmitted to the user's device for incorporation into
19 display-program variables (not shown) and presented appropriately on a display
20 such as the one shown at 4a in Fig. 2.

21 The Wang Reference

22 Wang discloses communication systems for portable transceivers and
23 methods and systems that trace the locations of portable transceivers.
24
25

Perhaps a good place to start a discussion of Wang is with its Fig. 1. There, Wang shows a hierarchical structure for a communication system 100. Wang instructs that covered area of the communication system 100 is organized into a hierarchical structure having several layers. The highest layer may be the earth 102 followed by country 104, state 106, area code 108, city 110, and the lowest layer (Layer 1) is a primary layer that comprises a plurality of independent paging regions (cells) 112. According to Wang, each region defines an area or location in which one may be paged. Each layer 1 cell comprises one or more base stations. Layer 1 may comprise a radio telephone communication system (e.g., Digital European Cordless Telephone).

As Wang instructs, each block in layers 2 through 6 (the secondary layers) is a communication service node representing a *switching station having computing and memory means* (i.e., all layers >1 are intelligent layers). The memory means (at each of the switching stations) comprises a database for tracking the location of customers (i.e., users of portable communication units that are registered in the system). Thus, what begins to emerge from a preliminary overview of Wang is a system in which transceivers are tracked by a number of geographically-separated switching stations, each with computing and memory means which includes a database to track customer locations.

The operation of Wang's system is probably best appreciated from its Fig. 5. There, Wang shows a diagram illustrating an example of how a customer or transceiver is traced via an address chain. In this example, an entity known as a "called party" (unit 24) has a home address in cell 1,d, and a current address at cell 8,d. In a first case, the communication unit 20, located in cell 2,c, places a call to communication unit 24. To do this, Wang instructs that the communication unit

1 20 dials the home address number of the called party. The calling party's
2 connection request is received by a base station at cell 2,c, and it is passed on to
3 the Boynton node in layer 2. That is, the connection request is passed on to a
4 different switching station with its own computing and memory means, as noted
5 above.

6 At the Boynton node, the corresponding database is searched for an entry
7 pertaining to the called party. In this case an entry is found in the database. The
8 entry contains the home address (HA) of the called party and an "OUT" indication
9 which indicates that the transceiver is outside of the covered region associated
10 with the Boynton node. This being the case, the call is then forwarded along the
11 address chain to the "407" node of layer 3, where the corresponding database also
12 contains the home address of the called party and an "OUT" indication which
13 indicates that the transceiver is outside of the covered region associated with the
14 "407" node. Thus, the connection request is further traced up through the Florida
15 node of layer 4, also indicating that the called party is "OUT". Then, in the U.S.A.
16 node of layer 5, with its associated computing and memory means (i.e. database),
17 indicates that the portable device 24 is in Georgia. The tracing then continues to
18 the Georgia node, where the area code "404" is indicated. Thereafter, the tracing
19 process continues to the "404" node, where "Atlanta" is indicated. Searching in
20 the Atlanta database reveals the location of the portable communication unit 24,
21 and the requested connection is made.

22 With respect to updating and maintaining all of the databases, Wang
23 instructs as follows. The database updating process is initiated by the portable
24 communication units. Each base station continuously transmits its subsystem
25 identification information. By monitoring this information from the surrounding

1 bases, an active portable communication unit is able to select a desired base station
2 (e.g., the strongest base) and lock on to it. Whenever a new strongest base station
3 is found, up to two messages may be transmitted to the associated bases to update
4 the address chains. The address of the base to which the portable communication
5 unit is locking is called the current address and the address of the base of the new
6 strongest base is called the new address.

7 8 The Claims

9 **Claim 1 recites a computing device comprising:**

- 10
- 11 • one or more processors;
 - 12 • memory operably associated with the one or more processors; and
 - 13 • a context service module loadable in the memory and executable by
14 the one or more processors to receive context information from one
15 or more context providers and process the information to determine
16 a current device context *by determining, from the context
information, at least one node associated with the context
structure of which said at least one node comprises a part.*

17 In making out various claim rejections in the present Office Action, the
18 Office notes that Hollenberg does not disclose "at least one node associated with
19 context information and traversing at least a portion of a hierarchical tree structure
20 of which said at least one node comprises a part." See, Office Action, page 3, 1st
21 Full Paragraph. Applicant agrees.

22 The Office then relies on Wang and argues that Wang discloses a
23 communication system with a hierarchical system of nodes organized into multiple
24
25

1 node trees which is capable of tracking the location of a transceiver as its moves
2 between nodes and the hierarchical tree structure.

3 The Office then argues that given Wang's teaching, a person of ordinary
4 skill would have readily recognized the desirability and the advantage of
5 modifying Hollenberg by employing the system of Wang "in order to provide a
6 method of linking root nodes of various trees for the advantage of determining
7 current location of a device.

8 Applicant respectfully disagrees with the Office's interpretation and
9 application of the cited references and submits that the Office has failed to
10 establish a *prima facie* case of obviousness.

11 To begin with, this claim recites a computing device comprising, *inter alia*,
12 a context service module that is loadable in the device's memory. The context
13 service module is recited to receive context information from one or more context
14 providers and process the information by determining at least one node associated
15 with the context information and traversing at least a portion of a hierarchical tree
16 structure of which the one node comprises a part. Thus, the recited tree traversal
17 takes place on board the computing device to determine the device's context.

18 Both Hollenberg and Wang teach directly away from any such subject
19 matter. Specifically, Hollenberg's system utilizes transceivers to transmit a gating
20 pulse which is received by a mobile computing device. The computing device
21 then responds to the gating pulse by transmitting an rf signal such that the
22 differences in arrival times of the transmitted signals at the transceivers is used to
23 compute the location of the device. The location coordinates of the mobile
24 computing device are then transmitted back to the computing device. Thus, the
25 location determination is performed off board of an associated device.

1 Wang discloses a system in which individual switching stations maintain
2 their own computing and memory means to track a particular device. Thus, the
3 device itself does not play an active role in determining its location. In fact, it
4 does not even appear to be necessary or even desirable for Wang's individual
5 devices to determine their own locations—because this is done for them by the
6 hierarchical system of geographically separated switching stations.

7 Thus, combining the teachings of these two references comes nowhere
8 close to rendering the subject matter of claim 1 obvious. Accordingly, for at least
9 this reason, the Office has failed to establish a *prima facie* case of obviousness.

10 Claims 2-12 depend from claim 1 and are allowable as depending from an
11 allowable base claim. These claims are also allowable for their own recited
12 features which, in combination with those recited in claim 1, are neither disclosed
13 nor suggested in the references of record, either singly or in combination with one
14 another. In addition, given the allowability of these claims, the rejection of claim
15 11 over the further combination with Reed is not seen to add anything of
16 significance.

17 Claim 13 *a computing device* comprising:

- 18
- 19 • one or more processors;
 - 20 • memory operably associated with the one or more processors; and
 - 21 • a location service module loadable in the memory and executable by
22 the one or more processors to receive location information from one
23 or more location providers and process the information to determine
24 a current device location *by determining, from the location
25 information, at least one node associated with the location
information and traversing at least a portion of a hierarchical tree
structure of which said at least one node comprises a part.*

1 This claim recites, *inter alia*, a location service module loadable in the
2 device's memory and executable to receive location information from one or more
3 location providers and determine the device's location by determining at least one
4 node associated with the location information and traversing at least a portion of a
5 hierarchical tree structure of which the one node comprises a part. Thus, location
6 determination is recited to be performed on board the device. Neither Hollenberg
7 nor Wang taken singly or in combination disclose or even remotely suggest this
8 subject matter of this claim. In fact, both references teach directly away from the
9 subject matter of this claim. As such, the Office has failed to establish a *prima*
10 *facie* case of obviousness and this claim is allowable.

11 **Claims 14-22** depend from claim 13 and are allowable as depending from
12 an allowable base claim. These claims are also allowable for their own recited
13 features which, in combination with those recited in claim 13, are neither disclosed
14 nor suggested in the references of record, either singly or in combination with one
15 another. In addition, given the allowability of these claims, the rejection of claim
16 21 over the combination with Reed is not seen to add anything of significance.

17 **Claim 23** recites a computing device comprising:

- 18
- 19 • one or more processors;
 - 20 • one or more computer-readable media;
 - 21 • *at least one hierarchical tree structure resident on the media and comprising multiple nodes each of which represents a geographical division of the Earth; and*
 - 22 • a location service module loadable in the memory and executable by
23 the one or more processors to receive location information from one
24 or more location providers and *process the information to determine a current device location that comprises a node of the hierarchical tree structure.*
- 25

1 Neither Hollenberg nor Wang disclose or suggest any such subject matter.
2 In point of fact, both references teach directly away from any such subject matter.
3 As such, the Office has failed to establish a *prima facie* case of obviousness and
4 this claim is allowable.

5 **Claims 24-31** depend from claim 23 and are allowable as depending from
6 an allowable base claim. These claims are also allowable for their own recited
7 features which, in combination with those recited in claim 23, are neither disclosed
8 nor suggested in the references of record, either singly or in combination with one
9 another.

10 **Claim 32** recites a computing device comprising:

- 11
- 12 • one or more processors;
 - 13 • one or more computer-readable media;
 - 14 • *at least one hierarchical tree structure resident on the media and comprising multiple nodes each of which represents a physical or logical entity; and*
 - 15 • a location service module loadable in the memory and executable by the one or more processors *to receive location information from one or more location providers and process the information to determine a current device location that comprises a node of the hierarchical tree structure.*
 - 16
 - 17
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19 Neither Hollenberg nor Wang disclose or suggest any such subject matter.
20 In point of fact, both references teach directly away from any such subject matter.
21 As such, the Office has failed to establish a *prima facie* case of obviousness and
22 this claim is allowable.

23 **Claims 33-36** depend from claim 32 and are allowable as depending from
24 an allowable base claim. These claims are also allowable for their own recited
25 features which, in combination with those recited in claim 32, are neither disclosed

1 nor suggested in the references of record, either singly or in combination with one
2 another.

3 **Claim 37 recites a *location-aware computing system* comprising:**

- 4 • one or more computing devices;
- 5 • *each* computing device having a software architecture comprising:
 - 6 ○ a location provider interface that is configured to receive location information;
 - 7 ○ a location service module communicatively associated with the location provider interface and configured to receive the location information from the multiple different location providers and process the information to ascertain a current device location *by determining, from the location information, at least one node associated with the location information and traversing at least a portion of a hierarchical tree structure of which said at least one node comprises a part;* and
 - 8 ○ one or more application program interfaces (API) or events associated with the location service module and defining a mechanism through which information concerning a current device location can be provided to one or more applications that are configured to provide location-specific services.

15
16 Neither Hollenberg nor Wang disclose or suggest any such subject matter.
17 In point of fact, both references teach directly away from any such subject matter.
18 As such, the Office has failed to establish a *prima facie* case of obviousness and
19 this claim is allowable. Given the allowability of this claim, the rejection over the
20 combination with Reed is not seen to add anything of significance. Accordingly,
21 for at least this reason, this claim is allowable.

22 **Claims 38-44** depend from claim 37 and are allowable as depending from
23 an allowable base claim. These claims are also allowable for their own recited
24 features which, in combination with those recited in claim 37, are neither disclosed
25

1 nor suggested in the references of record, either singly or in combination with one
2 another.

3 **Claim 45** recites a computer-implemented method of determining a
4 computing device context comprising:

- 5 • receiving, with a computing device, information that pertains to a
6 current context of the device;
- 7 • processing the information *on and with the device* to ascertain the
8 current context of the computing device *by determining, from the*
9 *information, at least one node associated with the information and*
10 *traversing at least a portion of a hierarchical tree structure of*
11 *which said at least one node comprises a part.*

12 Neither Hollenberg nor Wang disclose or suggest any such subject matter.
13 In point of fact, both references teach directly away from any such subject matter.
14 As such, the Office has failed to establish a *prima facie* case of obviousness and
15 this claim is allowable.

16 **Claims 46-57** depend from claim 45 and are allowable as depending from
17 an allowable base claim. These claims are also allowable for their own recited
18 features which, in combination with those recited in claim 45, are neither disclosed
19 nor suggested in the references of record, either singly or in combination with one
20 another.

21 **Claim 58** recites one or more computer-readable media having computer-
22 readable instructions thereon which, *when executed by a computing device*, cause
23 the computing device to:

- 24 • receive information that pertains to a current location of the device,
25 the information being received from multiple different location
providers; and

- 1 • process the information to *map the information to a node of a*
2 *hierarchical tree structure that comprises multiple nodes that*
3 *represent either (1) geographical divisions of the Earth or (2)*
4 *physical or logical entities; and*
- 5 • *traverse the hierarchical tree structure to ascertain the current*
6 *device location.*

7 Neither Hollenberg nor Wang disclose or suggest any such subject matter.

8 In point of fact, both references teach directly away from any such subject matter.

9 As such, the Office has failed to establish a *prima facie* case of obviousness and
10 this claim is allowable.

11 **Claim 59** recites a computer-implemented method of determining the
12 location of *a hand-held, mobile computing device* comprising:

- 13 • *maintaining a hierarchical tree structure on the mobile computing*
14 *device, the tree structure comprising multiple nodes each of which*
15 *represent geographical divisions of the Earth;*
- 16 • *receiving information from multiple different location providers that*
17 *describe aspects of a current device location;*
- 18 • *processing the information with the mobile device to ascertain a node*
19 *on the tree structure that likely constitutes a current device location;*
20 *and*
- 21 • *traversing at least one other node of the tree structure to ascertain*
22 *additional location information that is associated with the current*
23 *device location.*

24 Neither Hollenberg nor Wang disclose or suggest any such subject matter.

25 In point of fact, both references teach directly away from any such subject matter.

As such, the Office has failed to establish a *prima facie* case of obviousness and
this claim is allowable.

Claims 60-66 depend from claim 59 and are allowable as depending from
an allowable base claim. These claims are also allowable for their own recited

1 features which, in combination with those recited in claim 59, are neither disclosed
2 nor suggested in the references of record, either singly or in combination with one
3 another. In addition, given the allowability of this claim, the rejection of claim 63
4 over the combination with Reed is not seen to add anything of significance.

5 Claim 67 recites one or more computer-readable media having computer-
6 readable instructions thereon which, when executed by *a computing device*, cause
7 the computing device to:

- 8 • *maintain or access a hierarchical tree structure on or with the*
9 *computing device*, the tree structure comprising multiple nodes each
10 of which represent geographical divisions of the Earth;
- 11 • receive information from multiple different location providers that
12 describe aspects of a current device location;
- 13 • process the information with the device to ascertain a node on the
14 tree structure that likely constitutes a current device location;
- 15 • traverse at least one other node of the tree structure to ascertain
16 additional location information that is associated with the current
17 device location;
- 18 • receive one or more calls from one or more applications for
19 information that pertains to a current device location, the
20 applications being configured to render location-specific
21 information; and
- 22 • supply at least some information that pertains to the current device
23 location to the one or more applications.

19 Neither Hollenberg nor Wang disclose or suggest any such subject matter.
20 In point of fact, both references teach directly away from any such subject matter.
21 As such, the Office has failed to establish a *prima facie* case of obviousness and
22 this claim is allowable.
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C nclusion

All of the claims are in condition for allowance. Accordingly, Applicant requests a Notice of Allowability be issued forthwith. If the Office's next anticipated action is to be anything other than issuance of a Notice of Allowability, Applicant respectfully requests a telephone call for the purpose of scheduling an interview.

Respectfully Submitted,

Dated: 12/11/03By: 

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